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### Search Results -

Terms	Documents
L9 and (non-bioluminescent)	5

Database:

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US Patents Full-Text Database

US OCR Full-Text Database

EPO Abstracts Database

JPO Abstracts Database

Derwent World Patents Index

IBM Technical Disclosure Bulletins

Search:

L10

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### Search History

DATE: Friday, May 27, 2005   [Printable Copy](#)   [Create Case](#)

#### Set Name Query

side by side

#### Hit Count Set Name

result set

DB=USPT; PLUR=YES; OP=OR

<u>L10</u>	L9 and (non-bioluminescent)	5	<u>L10</u>
<u>L9</u>	L8 and l1	29566	<u>L9</u>
<u>L8</u>	fluorescent mutants and encoding DNA	144899	<u>L8</u>
<u>L7</u>	lukyanov.in.	8	<u>L7</u>
<u>L6</u>	L5 and (non-bioluminescent)	0	<u>L6</u>
<u>L5</u>	L and (non-aggregating)	97	<u>L5</u>
<u>L4</u>	L3 and (non-bioluminescent)	1	<u>L4</u>
<u>L3</u>	l1 and L2	18	<u>L3</u>
<u>L2</u>	Anthozoan	32	<u>L2</u>
<u>L1</u>	Cnidarian mutant	35368	<u>L1</u>

END OF SEARCH HISTORY

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## Search Results - Record(s) 1 through 5 of 5 returned.

### ☐ 1. Document ID: US 6841165 B1

L10: Entry 1 of 5

File: USPT

Jan 11, 2005

US-PAT-NO: 6841165

DOCUMENT-IDENTIFIER: US 6841165 B1

TITLE: Insecticidal agents

DATE-ISSUED: January 11, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Jarrett; Paul	Wellesbourne			GB
Morgan; James Alun Wynne	Swansea			GB
Ellis; Debbie	Warwick			GB

US-CL-CURRENT: [424/405](#); [424/409](#), [424/410](#), [424/418](#), [435/252.1](#), [435/252.31](#), [435/252.5](#),  
[435/69.1](#), [435/71.1](#), [435/822](#), [435/832](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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### ☐ 2. Document ID: US 6689391 B2

L10: Entry 2 of 5

File: USPT

Feb 10, 2004

US-PAT-NO: 6689391

DOCUMENT-IDENTIFIER: US 6689391 B2

TITLE: Natural non-polar fluorescent dye from a non-bioluminescent marine invertebrate, compositions containing the said dye and its uses

DATE-ISSUED: February 10, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Goswami; Usha	Goa			IN
Ganguly; Anutosh	Goa			IN

US-CL-CURRENT: [424/559](#); [424/520](#), [424/547](#), [435/41](#), [435/810](#), [435/968](#), [8/648](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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### ☐ 3. Document ID: US 6495355 B1

L10: Entry 3 of 5

File: USPT

Dec 17, 2002

US-PAT-NO: 6495355

DOCUMENT-IDENTIFIER: US 6495355 B1

TITLE: Red-shifted luciferase

DATE-ISSUED: December 17, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Contag; Christopher	San Jose	CA		
Eames; Brian	San Francisco	CA		

US-CL-CURRENT: 435/189; 435/320.1, 435/325, 435/8, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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☐ 4. Document ID: US 5741668 A

L10: Entry 4 of 5

File: USPT

Apr 21, 1998

US-PAT-NO: 5741668

DOCUMENT-IDENTIFIER: US 5741668 A

\*\* See image for Certificate of Correction \*\*

TITLE: Expression of a gene for a modified green-fluorescent protein

DATE-ISSUED: April 21, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; William W.	Metuchen	NJ		
Chalfie; Martin	New York	NY		

US-CL-CURRENT: 435/69.1; 435/189, 435/252.3, 435/252.33, 435/320.1, 435/71.1, 435/8, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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☐ 5. Document ID: US 5593827 A

L10: Entry 5 of 5

File: USPT

Jan 14, 1997

US-PAT-NO: 5593827

DOCUMENT-IDENTIFIER: US 5593827 A

TITLE: Autoinducer

DATE-ISSUED: January 14, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bycroft; Barrie W.	Nottingham			GB
Williams; Paul	Nottingham			GB
Stewart; Gordon S. A. B.	Loughborough			GB
Chhabra; Siri R.	Loughborough			GB
Stead; Paul	Broadstone			GB
Winson; Michael K.	Nottingham			GB
Hill; Philip J.	Nottingham			GB
Rees; Catherine E. D.	Nottingham			GB

US-CL-CURRENT: [435/6](#); [435/34](#), [540/202](#), [548/124](#), [549/321](#), [549/322](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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Terms	Documents
L9 and (non-bioluminescent)	5

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Search Results - Record(s) 1 through 1 of 1 returned.

☐ 1. Document ID: US 6689391 B2

L4: Entry 1 of 1

File: USPT

Feb 10, 2004

US-PAT-NO: 6689391

DOCUMENT-IDENTIFIER: US 6689391 B2

TITLE: Natural non-polar fluorescent dye from a non-bioluminescent marine invertebrate, compositions containing the said dye and its uses

DATE-ISSUED: February 10, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Goswami; Usha	Goa			IN
Ganguly; Anutosh	Goa			IN

US-CL-CURRENT: 424/559; 424/520, 424/547, 435/41, 435/810, 435/968, 8/648

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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Terms	Documents
L3 and (non-bioluminescent)	1

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## Search Results - Record(s) 1 through 8 of 8 returned.

### ☐ 1. Document ID: US 6180114 B1

L7: Entry 1 of 8

File: USPT

Jan 30, 2001

US-PAT-NO: 6180114

DOCUMENT-IDENTIFIER: US 6180114 B1

**\*\* See image for Certificate of Correction \*\***

TITLE: Therapeutic delivery using compounds self-assembled into high axial ratio microstructures

DATE-ISSUED: January 30, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yager; Paul	Seattle	WA		
Gelb; Michael H.	Seattle	WA		
<u>Lukyanov</u> ; Anatoly N.	Seattle	WA		
Goldstein; Alex S.	Seattle	WA		
Disis; Mary L.	Renton	WA		

US-CL-CURRENT: 424/400; 424/409, 424/450, 514/44

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMIC	Draw Desc	Ima
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### ☐ 2. Document ID: US 6007010 A

L7: Entry 2 of 8

File: USPT

Dec 28, 1999

US-PAT-NO: 6007010

DOCUMENT-IDENTIFIER: US 6007010 A

TITLE: Centrifugal grinder

DATE-ISSUED: December 28, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuchersky; Nikolai Ivanovich	Navoi		706800	UZ
Averochkin; Evgeny Alexeevich	Voronezh		394086	RU
Prokhorenko; Gennady Alexeevich	Zarafshan		706801	UZ
<u>Lukyanov</u> ; Alexandr Nikolaevich	Moscow		117334	RU
Sytenkov; Viktor Nikolaevich	Zarafshan		706801	UZ

US-CL-CURRENT: 241/275; 241/300

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMIC	Draw Desc	Ima
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☐ 3. Document ID: US 5851536 A

L7: Entry 3 of 8

File: USPT

Dec 22, 1998

US-PAT-NO: 5851536

DOCUMENT-IDENTIFIER: US 5851536 A

TITLE: Therapeutic delivery using compounds self-assembled into high axial ratio microstructures

DATE-ISSUED: December 22, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yager; Paul	Seattle	WA		
Gelb; Michael H.	Seattle	WA		
Carlson; Paul A.	Seattle	WA		
Lee; Kyujin C.	Seattle	WA		
<u>Lukyanov</u> ; Anatoly N.	Seattle	WA		
Goldstein; Alex S.	Seattle	WA		

US-CL-CURRENT: 424/400; 424/450

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw Desc	Ima
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☐ 4. Document ID: US 5297810 A

L7: Entry 4 of 8

File: USPT

Mar 29, 1994

US-PAT-NO: 5297810

DOCUMENT-IDENTIFIER: US 5297810 A

TITLE: Transport means for invalids

DATE-ISSUED: March 29, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Lukyanov</u> ; Sergei N.	Moscow			SU

US-CL-CURRENT: 280/250.1; 280/233, 280/234, 280/240, 280/242.1, D12/128

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw Desc	Ima
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☐ 5. Document ID: US 4453348 A

L7: Entry 5 of 8

File: USPT

Jun 12, 1984

US-PAT-NO: 4453348

DOCUMENT-IDENTIFIER: US 4453348 A

TITLE: Apparatus for abrasive machining of workpieces

DATE-ISSUED: June 12, 1984

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
------	------	-------	----------	---------

Tolstopyatov; Konstantin S.	Elektrostal Moskovskoi oblasti	SU
<u>Lukyanov</u> ; Anatoly A.	Noginsk Moskovskoi oblasti	SU
Burmakin; Viktor I.	Elektrostal Moskovskoi oblasti	SU
Pryanishnikov; Igor S.	Elektrostal Moskovskoi oblasti	SU
Maslov; Gennady N.	Elektrostal Moskovskoi oblasti	SU
Zemtsov; Mikhail U.	Moscow	SU
Bobovnikov; Nikolai G.	Elektrostal Moskovskoi oblasti	SU
Sorokin; Viktor A.	Elektrostal Moskovskoi oblasti	SU
Marchenkov; Nikolai B.	Elektrostal Moskovskoi oblasti	SU
Pyatibrat; Alexandr L.	Elektrostal Moskovskoi oblasti	SU
Tonaevsky; Ernst L.	Noginsk Moskovskoi oblasti	SU

US-CL-CURRENT: 451/259; 451/363

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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☐ 6. Document ID: US 4407095 A

L7: Entry 6 of 8

File: USPT

Oct 4, 1983

US-PAT-NO: 4407095

DOCUMENT-IDENTIFIER: US 4407095 A

TITLE: Device for abrasive cleaning of blanks shaped as bodies of revolution

DATE-ISSUED: October 4, 1983

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tolstopyatov; Konstantin S.	Elektrostal Moskovskoi oblasti			SU
<u>Lukyanov</u> ; Anatoly A.	Noginsk Moskovsoi oblasti			SU
Pyatibrat; Alexandr L.	Elektrostal Moskovskoi oblasti			SU
Pryanishnikov; Igor S.	Elektrostal Moskovskoi oblasti			SU
Maslov; Gennady N.	Elektrostal Moskovskoi oblasti			SU
Bobovnikov; Nikolai G.	Elektrostal Moskovskoi oblasti			SU
Gubin; Petr V.	Elektrostal Moskovskoi oblasti			SU
Burmakin; Viktor I.	Elektrostal Moskovskoi oblasti			SU
Marchenkov; Nikolai B.	Elektrostal Moskovskoi oblasti			SU
Chirkin; Alexandr F.	Elektrostal Moskovskoi oblasti			SU
Zemtsov; Mikhail U.	Moscow			SU
Tonaevsky; Ernst L.	Noginsk Moskovskoi oblasti			SU

US-CL-CURRENT: 451/261; 451/269

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Ima
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☐ 7. Document ID: US 4266922 A

L7: Entry 7 of 8

File: USPT

May 12, 1981

US-PAT-NO: 4266922

DOCUMENT-IDENTIFIER: US 4266922 A

TITLE: Mold for manufacturing abrasive segments



DATE-ISSUED: May 12, 1981

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Birjukov; Mikhail N.	Elektrostal	Moskovskoi oblasti		SU
Maslov; Gennady N.	Elektrostal	Moskovskoi oblasti		SU
Smorodinnikov; Vladimir P.	V. Dubrovo	Sverdlovskoi oblasti		SU
Kulikov; Anatoly P.	V. Dubrovo	Sverdlovskoi oblasti		SU
Udilova; Ida G.	V. Dubrovo	Sverdlovskoi oblasti		SU
Zuev; Vladimir K.	Elektrostal	Moskovskoi oblasti		SU
Lukyanov; Anatoly A.	Noginsk	Moskovskoi oblasti		SU
Tolstopyatov; Konstantin S.	Elektrostal	Moskovskoi oblasti		SU
Kalinichev; Alexandr E.	Elektrostal	Moskovskoi oblasti		SU
Zhabin; Ivan Y.	Elektrostal	Moskovskoi oblasti		SU

US-CL-CURRENT: 425/182; 249/139, 249/161, 249/163, 249/164, 249/167, 249/219.1, 425/186, 425/195, 425/406

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 8. Document ID: US 4055722 A

L7: Entry 8 of 8

File: USPT

Oct 25, 1977

US-PAT-NO: 4055722

DOCUMENT-IDENTIFIER: US 4055722 A

TITLE: Electrode holder

DATE-ISSUED: October 25, 1977

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lukyanov; Jury Sergeevich	Novosibirsk			SU
Kazantsev; Lev Seliverstovich	Novosibirsk			SU
Pomeschikov; Andrei Grigorievich	Novosibirsk			SU
Skvortsov; Gennady Fedorovich	Novosibirsk			SU

US-CL-CURRENT: 373/53

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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lukyanov.in.

8

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NEWS	2		"Ask CAS" for self-help around the clock
NEWS	3	FEB 25	CA/CAPLUS - Russian Agency for Patents and Trademarks (ROSPATENT) added to list of core patent offices covered
NEWS	4	FEB 28	PATDPAFULL - New display fields provide for legal status data from INPADOC
NEWS	5	FEB 28	BABS - Current-awareness alerts (SDIs) available
NEWS	6	FEB 28	MEDLINE/LMEDLINE reloaded
NEWS	7	MAR 02	GBFULL: New full-text patent database on STN
NEWS	8	MAR 03	REGISTRY/ZREGISTRY - Sequence annotations enhanced
NEWS	9	MAR 03	MEDLINE file segment of TOXCENTER reloaded
NEWS	10	MAR 22	KOREAPAT now updated monthly; patent information enhanced
NEWS	11	MAR 22	Original IDE display format returns to REGISTRY/ZREGISTRY
NEWS	12	MAR 22	PATDPASPC - New patent database available
NEWS	13	MAR 22	REGISTRY/ZREGISTRY enhanced with experimental property tags
NEWS	14	APR 04	EPFULL enhanced with additional patent information and new fields
NEWS	15	APR 04	EMBASE - Database reloaded and enhanced
NEWS	16	APR 18	New CAS Information Use Policies available online
NEWS	17	APR 25	Patent searching, including current-awareness alerts (SDIs), based on application date in CA/CAPLUS and USPATFULL/USPAT2 may be affected by a change in filing date for U.S. applications.
NEWS	18	APR 28	Improved searching of U.S. Patent Classifications for U.S. patent records in CA/CAPLUS
NEWS	19	MAY 23	GBFULL enhanced with patent drawing images
NEWS	20	MAY 23	REGISTRY has been enhanced with source information from CHEMCATS
NEWS	21	MAY 26	STN User Update to be held June 6 and June 7 at the SLA 2005 Annual Conference
NEWS EXPRESS			JANUARY 10 CURRENT WINDOWS VERSION IS V7.01a, CURRENT MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP), AND CURRENT DISCOVER FILE IS DATED 10 JANUARY 2005
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FILE 'HOME' ENTERED AT 15:07:33 ON 27 MAY 2005

=> file, medline, uspatful, dgene, embase, wpids, fsta,  
FILE, IS NOT A RECOGNIZED COMMAND  
The previous command name entered was not recognized by the system.  
For a list of commands available to you in the current file, enter  
"HELP COMMANDS" at an arrow prompt (=>).

=> s Cnidarian mutant  
THIS COMMAND NOT AVAILABLE IN THE CURRENT FILE  
Some commands only work in certain files. For example, the EXPAND  
command can only be used to look at the index in a file which has an  
index. Enter "HELP COMMANDS" at an arrow prompt (=>) for a list of  
commands which can be used in this file.

=> file medline, biosis, uspatful, dgene, embase, wpids		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	0.42	0.42

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E1 1 LUKAY R F/AU  
E2 1 LUKAY RICHARD F/AU  
E3 0 --> LUKAYANOV/AU  
E4 1 LUKAYANOV A/AU  
E5 1 LUKAZ K/AU  
E6 1 LUKAZEWICZ M/AU  
E7 2 LUKAZEWICZ M J/AU  
E8 2 LUKAZEWSKI A A/AU  
E9 1 LUKAZEWSKI K M/AU  
E10 1 LUKAZHEVA E V/AU  
E11 2 LUKAZIEWICZ M/AU  
E12 1 LUKAZKAJA I A/AU

=> s e4  
L1 1 "LUKAYANOV A"/AU

=> d l1 ti abs ibib tot

L1 ANSWER 1 OF 1 WPIDS COPYRIGHT 2005 THE THOMSON CORP on STN  
TI Current-driven liquid metal electrolyte system e.g. aluminum reduction

cell, uses additional, external, time-varying and/or alternating vertical magnetic field.

AN 2003-559424 [52] WPIDS

AB WO2003057945 A UPAB: 20030813

NOVELTY - An additional, external, time-varying and/or alternating vertical magnetic field is applied on the electrolyte system, with the frequency and amplitude of the field being approximated through wave reflection analysis on an infinite wall.

USE - Current-driven liquid metal electrolyte system e.g. aluminum reduction cell used in aluminum smelting plant.

ADVANTAGE - Improves the efficiency of the electrolyte system and reduces the operating costs. The instability due to the interaction of the current induced by the interface motion with external magnetic field is eliminated. By employing wave reflection analysis, appropriate field can be applied even by unskilled labor.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic view of the current-driven liquid metal electrolyte systems.

Dwg.4/8

ACCESSION NUMBER: 2003-559424 [52] WPIDS

DOC. NO. CPI: C2003-150841

TITLE: Current-driven liquid metal electrolyte system e.g. aluminum reduction cell, uses additional, external, time-varying and/or alternating vertical magnetic field.

DERWENT CLASS: M28

INVENTOR(S): EL, G; LUKANYOV, A; MOLOKOV, S; LUKAYANOV, A

PATENT ASSIGNEE(S): (UYCO-N) UNIV COVENTRY

COUNTRY COUNT: 103

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2003057945	A2	20030717	(200352)*	EN	25
RW:	AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW				
W:	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW				
AU 2003202002	A1	20030724	(200421)		
EP 1463848	A2	20041006	(200465)	EN	
R:	AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR				
NO 2004003250	A	20040803	(200515)		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2003057945	A2	WO 2003-GB72	20030110
AU 2003202002	A1	AU 2003-202002	20030110
EP 1463848	A2	EP 2003-700854	20030110
		WO 2003-GB72	20030110
NO 2004003250	A	WO 2003-GB72	20030110
		NO 2004-3250	20040803

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2003202002	A1 Based on	WO 2003057945
EP 1463848	A2 Based on	WO 2003057945

=> s cnidarian mutatn  
L2 0 CNIDARIAN MUTATN

=> s cnidarian mutant  
L3 0 CNIDARIAN MUTANT

=> s (chromo or fluorescent protein)  
4 FILES SEARCHED...  
L4 71567 (CHROMO OR FLUORESCENT PROTEIN)

=> s l4 and DNA  
L5 30723 L4 AND DNA

=> s l5 and (protein mutant)  
L6 225 L5 AND (PROTEIN MUTANT)

=> s l6 and (anthozoan)  
L7 38 L6 AND (ANTHOZOAN)

=> s l7 and (non-bioluminescent)  
L8 23 L7 AND (NON-BIOLUMINESCENT)

=> d l8 ti abs ibib tot

L8 ANSWER 1 OF 23 USPATFULL on STN

TI Mutant chromophores/fluorophores and methods for making and using the same

AB Nucleic acid compositions encoding mutants of wild-type **chromo** /fluoroproteins whose **chromo**/fluorescent properties have been interconverted, as well as the proteins encoded the same, are provided. Also provided are methods for interconverting chromoproteins to fluorescent proteins, and vice versa. Also of interest are proteins that are substantially similar to, or mutants of, the above specific proteins. Also provided are fragments of the nucleic acids and the peptides encoded thereby, as well as antibodies to the subject proteins and transgenic cells and organisms. The subject protein and nucleic acid compositions find use in a variety of different applications. Finally, kits for use in such applications, e.g., that include the subject nucleic acid compositions, are provided.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2004:314508 USPATFULL

TITLE: Mutant chromophores/fluorophores and methods for making and using the same

INVENTOR(S): Bulina, Maria E., Moscow, RUSSIAN FEDERATION  
Chudakov, Dmitry, Moscow, RUSSIAN FEDERATION  
Lukyanov, Konstantin A., Moscow, RUSSIAN FEDERATION

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004248180	A1	20041209
APPLICATION INFO.:	US 2004-845484	A1	20040512 (10)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. WO 2002-US41418, filed on 23 Dec 2002, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-343128P	20011226 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	

LEGAL REPRESENTATIVE: BOZICEVIC, FIELD & FRANCIS (BD BIOSCIENCES), 1900  
UNIVERSITY AVENUE, SUITE 200, EAST PALO ALTO, CA, 94303  
NUMBER OF CLAIMS: 26  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 3 Drawing Page(s)  
LINE COUNT: 2020  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 2 OF 23 USPATFULL on STN

TI Non aggregating fluorescent proteins and methods for using the same  
AB Nucleic acid compositions encoding non-aggregating **chromo**  
/fluoroproteins and mutants thereof, as well as the proteins encoded by  
the same, are provided. The proteins of interest are polypeptides that  
are non-aggregating colored and/or fluorescent proteins, where the the  
non-aggregating feature arises from the modulation of residues in the  
N-terminus of the protein and the **chromo** and/or fluorescent  
feature arises from the interaction of two or more residues of the  
protein. Also provided are fragments of the subject nucleic acids and  
the peptides encoded thereby, as well as antibodies to the subject  
proteins and transgenic cells and organisms. The subject protein and  
nucleic acid compositions find use in a variety of different  
applications. Finally, kits for use in such applications, e.g., that  
include the subject nucleic acid compositions, are provided.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:30340 USPATFULL  
TITLE: Non aggregating fluorescent proteins and methods for  
using the same  
INVENTOR(S): Lukyanov, Sergey, Moscow, RUSSIAN FEDERATION  
Lukyanov, Konstantin, Moscow, RUSSIAN FEDERATION  
Yanushevich, Yuriy, Moscow, RUSSIAN FEDERATION  
Savitsky, Alexandr, Moscow, RUSSIAN FEDERATION  
Fradkov, Arcady, Moscow, RUSSIAN FEDERATION

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003022287	A1	20030130
APPLICATION INFO.:	US 2002-81864	A1	20020220 (10)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 2001-6922, filed on 4 Dec 2001, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-270983P	20010221 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	BOZICEVIC, FIELD & FRANCIS LLP, 200 MIDDLEFIELD RD, SUITE 200, MENLO PARK, CA, 94025	
NUMBER OF CLAIMS:	20	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	15 Drawing Page(s)	
LINE COUNT:	2207	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 3 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN

TI Novel nucleic acid encoding interconverted mutant of **chromo**-or  
**fluorescent protein** which are useful as biosensors,  
coloring agents.

AN ADH34496 protein DGENE

AB The invention relates to interconverted mutants of chromoproteins (CP) or  
fluorescent proteins (FP) and nucleic acids encoding them. The mutant is  
derived from a Cnidarian species, preferably a **non-**  
**bioluminescent** Cnidarian species, and most preferably an

**Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents an Anemonia sulcata purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 43.

ACCESSION NUMBER: ADH34496 protein DGENE  
 TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
 INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
 PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
 PATENT INFO: WO 2003057833 A2 20030717 56  
 APPLICATION INFO: WO 2002-US41418 20021223  
 PRIORITY INFO: US 2001-343128P 20011226  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 OTHER SOURCE: 2003-607998 [57]  
 DESCRIPTION: Anemonia sulcata asCP mutant H203Q.

L8 ANSWER 4 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
 TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

AN ADH34504 protein DGENE  
 AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a non-

**bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a Discosoma sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34504 protein DGENE  
 TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
 INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
 PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
 PATENT INFO: WO 2003057833 A2 20030717 56  
 APPLICATION INFO: WO 2002-US41418 20021223  
 PRIORITY INFO: US 2001-343128P 20011226  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 OTHER SOURCE: 2003-607998 [57]  
 DESCRIPTION: Discosoma sp. DsRed mutant S148A/I165S/K167M/S203A.

L8 ANSWER 5 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
 TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
 AN ADH34501 protein DGENE  
 AB The invention relates to interconverted mutants of chromoproteins (CP) or



fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a Discosoma sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34501 protein DGENE  
 TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
 INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
 PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
 PATENT INFO: WO 2003057833 A2 20030717 56  
 APPLICATION INFO: WO 2002-US41418 20021223  
 PRIORITY INFO: US 2001-343128P 20011226  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 OTHER SOURCE: 2003-607998 [57]  
 DESCRIPTION: Discosoma sp. DsRed mutant S148A/K167M.

L8 ANSWER 6 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
 TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

AN ADH34491 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents an Anemonia sulcata purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34491 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Anemonia sulcata asCP mutant S165V.

L8 ANSWER 7 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors,

coloring agents.

AN ADH34502 protein DGENE

AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a Discosoma sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34502 protein DGENE

TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

INVENTOR: Bulina M E; Chudakov D; Lukyanov K A

PATENT ASSIGNEE: (CLON-N)CLONTECH LAB INC.

PATENT INFO: WO 2003057833 A2 20030717 56

APPLICATION INFO: WO 2002-US41418 20021223

PRIORITY INFO: US 2001-343128P 20011226

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: 2003-607998 [57]

DESCRIPTION: Discosoma sp. DsRed mutant S148A/K167M/S203A.

TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

AN ADH34494 protein DGENE

AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents an *Anemonia sulcata* purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 43.

ACCESSION NUMBER: ADH34494 protein DGENE

TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

INVENTOR: Bulina M E; Chudakov D; Lukyanov K A

PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.

PATENT INFO: WO 2003057833 A2 20030717 56

APPLICATION INFO: WO 2002-US41418 20021223

PRIORITY INFO: US 2001-343128P 20011226

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: 2003-607998 [57]

DESCRIPTION: *Anemonia sulcata* asCP mutant H176R/K219I.

L8 ANSWER 9 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
AN ADH34503 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a *Discosoma* sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34503 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]

DESCRIPTION: Discosoma sp. DsRed mutant S148A/I165S/S203A.

L8 ANSWER 10 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN

TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

AN ADH34497 protein DGENE

AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents an Anemonia sulcata purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 43.

ACCESSION NUMBER: ADH34497 protein DGENE

TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

INVENTOR: Bulina M E; Chudakov D; Lukyanov K A

PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.

PATENT INFO: WO 2003057833 A2 20030717

56

APPLICATION INFO: WO 2002-US41418 20021223

PRIORITY INFO: US 2001-343128P 20011226

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Anemonia sulcata asCP mutant Q220L.

L8 ANSWER 11 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
AN ADH34492 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents an Anemonia sulcata purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 43.

ACCESSION NUMBER: ADH34492 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent

LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Anemonia sulcata asCP mutant S68G.

L8 ANSWER 12 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
AN ADH34500 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a Discosoma sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34500 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223



PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Discosoma sp. DsRed mutant S148A/S203A.

L8 ANSWER 13 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
AN ADH34505 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a Discosoma sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34505 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.

PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Discosoma sp. DsRed mutant S148C/I165N/S203A.

L8 ANSWER 14 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
AN ADH34499 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant **DNA** applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a Discosoma sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34499 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Discosoma sp. DsRed mutant S203A.

L8 ANSWER 15 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN

TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

AN ADH34498 protein DGENE

AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant **DNA** applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a Discosoma sp. red **fluorescent protein** DsRed mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34498 protein DGENE

TITLE: Novel nucleic acid encoding interconverted mutant of

**chromo-or fluorescent protein**  
 which are useful as biosensors, coloring agents.

INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
 PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
 PATENT INFO: WO 2003057833 A2 20030717 56  
 APPLICATION INFO: WO 2002-US41418 20021223  
 PRIORITY INFO: US 2001-343128P 20011226  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 OTHER SOURCE: 2003-607998 [57]  
 DESCRIPTION: Discosoma sp. DsRed mutant S148A.

L8 ANSWER 16 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN

TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.

AN ADH34490 protein DGENE

AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as colouring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents an Anemonia sulcata purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34490 protein DGENE

TITLE: Novel nucleic acid encoding interconverted mutant of  
**chromo-or fluorescent protein**  
 which are useful as biosensors, coloring agents.  
 INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
 PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
 PATENT INFO: WO 2003057833 A2 20030717 56  
 APPLICATION INFO: WO 2002-US41418 20021223  
 PRIORITY INFO: US 2001-343128P 20011226  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 OTHER SOURCE: 2003-607998 [57]  
 DESCRIPTION: Anemonia sulcata asCP mutant A148S.

L8 ANSWER 17 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
 TI Novel nucleic acid encoding interconverted mutant of **chromo-or**  
**fluorescent protein** which are useful as biosensors,  
 coloring agents.  
 AN ADH34489 protein DGENE  
 AB The invention relates to interconverted mutants of chromoproteins (CP) or  
 fluorescent proteins (FP) and nucleic acids encoding them. The mutant is  
 derived from a Cnidarian species, preferably a **non-**  
**bioluminescent** Cnidarian species, and most preferably an  
**Anthozoan** species. The invention is based on the finding that  
 although green fluorescent protein (GFP)-like chromoproteins and  
 fluorescent proteins exhibit some degree of homology, there are certain  
 positions (referred to as 148, 165, 167 and 203; numbering corresponds  
 to GFP) that are occupied by noticeably different residues in the two  
 types of proteins. Mutagenesis of the residues in these key positions  
 in, for example, a **fluorescent protein**, to those  
 found in a chromoprotein is therefore proposed to confer chromoprotein  
 activity on the **fluorescent protein mutant**,  
 with chromoproteins being able to be converted into fluorescent proteins  
 in a similar manner. The invention also relates to expression  
 constructs, vectors, host cells and host cell progeny comprising a  
 nucleic acid of the invention; the recombinant production of an  
 interconverted chromoprotein or **fluorescent protein**  
**mutant**; and antibodies specific for interconverted mutant  
 proteins of the invention. The interconverted mutants are useful in any  
 application that employs a chromoprotein or **fluorescent**  
**protein**. Fluorescent protein mutants having chromoprotein  
 activity can be useful as coloring agents in, for example, food  
 compositions, pharmaceuticals, cosmetics and living organisms. Proteins  
 with chromoprotein activity are also useful as labels in biological  
 analyte detection assays, as selectable markers in recombinant  
**DNA** applications (e.g. the production of transgenic cells and  
 organisms), and are also useful as sunscreens and selective filters.  
 Chromoprotein mutants having fluorescent protein activity useful in  
 fluorescence resonance energy transfer (FRET) applications, as  
 biosensors in prokaryotic and eukaryotic cells, as markers of whole  
 cells to detect changes in multicellular reorganisation and migration,  
 as second messenger detectors, as in vivo markers in animals (e.g.,  
 transgenic animals), in fluorescence activated cell sorting  
 applications, in protease cleavage assays, and in assays to determine  
 the phospholipid composition in biological membranes. Proteins with  
**fluorescent protein** activity can also be used as  
 fluorescent timers, where the switch of one fluorescent colour to  
 another (e.g., green to red) is concomitant with the ageing of the  
 protein and is useful for determination of the activation or  
 deactivation of gene expression. The present sequence represents a  
 wild-type red **fluorescent protein**, DsRed, from  
 Discosoma sp. that was used as a parent sequence for the generation of  
 mutant proteins in an example of the invention.  
 ACCESSION NUMBER: ADH34489 protein DGENE

TITLE: Novel nucleic acid encoding interconverted mutant of  
**chromo-or fluorescent protein**  
 which are useful as biosensors, coloring agents.  
 INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
 PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
 PATENT INFO: WO 2003057833 A2 20030717 56  
 APPLICATION INFO: WO 2002-US41418 20021223  
 PRIORITY INFO: US 2001-343128P 20011226  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 OTHER SOURCE: 2003-607998 [57]  
 DESCRIPTION: Discosoma sp. red **fluorescent protein**  
 DsRed (wild-type).

L8 ANSWER 18 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
 TI Novel nucleic acid encoding interconverted mutant of **chromo-or**  
**fluorescent protein** which are useful as biosensors,  
 coloring agents.  
 AN ADH34488 protein DGENE  
 AB The invention relates to interconverted mutants of chromoproteins (CP) or  
 fluorescent proteins (FP) and nucleic acids encoding them. The mutant is  
 derived from a Cnidarian species, preferably a **non-**  
**bioluminescent** Cnidarian species, and most preferably an  
**Anthozoan** species. The invention is based on the finding that  
 although green fluorescent protein (GFP)-like chromoproteins and  
 fluorescent proteins exhibit some degree of homology, there are certain  
 positions (referred to as 148, 165, 167 and 203; numbering corresponds  
 to GFP) that are occupied by noticeably different residues in the two  
 types of proteins. Mutagenesis of the residues in these key positions  
 in, for example, a **fluorescent protein**, to those  
 found in a chromoprotein is therefore proposed to confer chromoprotein  
 activity on the **fluorescent protein mutant**,  
 with chromoproteins being able to be converted into fluorescent proteins  
 in a similar manner. The invention also relates to expression  
 constructs, vectors, host cells and host cell progeny comprising a  
 nucleic acid of the invention; the recombinant production of an  
 interconverted chromoprotein or **fluorescent protein**  
**mutant**; and antibodies specific for interconverted mutant  
 proteins of the invention. The interconverted mutants are useful in any  
 application that employs a chromoprotein or **fluorescent**  
**protein**. Fluorescent protein mutants having chromoprotein  
 activity can be useful as colouring agents in, for example, food  
 compositions, pharmaceuticals, cosmetics and living organisms. Proteins  
 with chromoprotein activity are also useful as labels in biological  
 analyte detection assays, as selectable markers in recombinant  
**DNA** applications (e.g. the production of transgenic cells and  
 organisms), and are also useful as sunscreens and selective filters.  
 Chromoprotein mutants having fluorescent protein activity useful in  
 fluorescence resonance energy transfer (FRET) applications, as  
 biosensors in prokaryotic and eukaryotic cells, as markers of whole  
 cells to detect changes in multicellular reorganisation and migration,  
 as second messenger detectors, as in vivo markers in animals (e.g.,  
 transgenic animals), in fluorescence activated cell sorting  
 applications, in protease cleavage assays, and in assays to determine  
 the phospholipid composition in biological membranes. Proteins with  
**fluorescent protein** activity can also be used as  
 fluorescent timers, where the switch of one fluorescent colour to  
 another (e.g., green to red) is concomitant with the ageing of the  
 protein and is useful for determination of the activation or  
 deactivation of gene expression. The present sequence represents green  
**fluorescent protein** (GFP) from the jellyfish *Aequorea*  
*victoria*.

ACCESSION NUMBER: ADH34488 protein DGENE

TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
 INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
 PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
 PATENT INFO: WO 2003057833 A2 20030717 56  
 APPLICATION INFO: WO 2002-US41418 20021223  
 PRIORITY INFO: US 2001-343128P 20011226  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 OTHER SOURCE: 2003-607998 [57]  
 DESCRIPTION: Aequorea victoria green **fluorescent protein** (GFP).

L8 ANSWER 19 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
 TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
 AN ADH34506 protein DGENE  
 AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a non-fluorescent *Discosoma* sp. red **fluorescent protein** DsRed mutant, DsRed-NF, which has chromoprotein activity and which was generated in an example of the invention. The present sequence is not

shown in the specification, but was derived from the wild-type DsRed sequence (ADH34489) shown in Fig 1 and the information provided on page 42.

ACCESSION NUMBER: ADH34506 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of  
**chromo-or fluorescent protein**  
which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Discosoma sp. DsRed mutant DsRed-NF S148C/I165N/K167M/S203A.

L8 ANSWER 20 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
AN ADH34487 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant DNA applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or deactivation of gene expression. The present sequence represents a



wild-type purple chromoprotein, asCP, from the snake-locks sea anemone Anemonia sulcata that was used as a parent sequence for the generation of mutant proteins in an example of the invention.

ACCESSION NUMBER: ADH34487 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of  
**chromo-or fluorescent protein**  
which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Anemonia sulcata purple chromoprotein asCP (wild-type).

L8 ANSWER 21 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or**  
**fluorescent protein** which are useful as biosensors,  
coloring agents.  
AN ADH34495 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or  
fluorescent proteins (FP) and nucleic acids encoding them. The mutant is  
derived from a Cnidarian species, preferably a **non-**  
**bioluminescent** Cnidarian species, and most preferably an  
**Anthozoan** species. The invention is based on the finding that  
although green fluorescent protein (GFP)-like chromoproteins and  
fluorescent proteins exhibit some degree of homology, there are certain  
positions (referred to as 148, 165, 167 and 203; numbering corresponds  
to GFP) that are occupied by noticeably different residues in the two  
types of proteins. Mutagenesis of the residues in these key positions  
in, for example, a **fluorescent protein**, to those  
found in a chromoprotein is therefore proposed to confer chromoprotein  
activity on the **fluorescent protein mutant**,  
with chromoproteins being able to be converted into fluorescent proteins  
in a similar manner. The invention also relates to expression  
constructs, vectors, host cells and host cell progeny comprising a  
nucleic acid of the invention; the recombinant production of an  
interconverted chromoprotein or **fluorescent protein**  
**mutant**; and antibodies specific for interconverted mutant  
proteins of the invention. The interconverted mutants are useful in any  
application that employs a chromoprotein or **fluorescent**  
**protein**. Fluorescent protein mutants having chromoprotein  
activity can be useful as colouring agents in, for example, food  
compositions, pharmaceuticals, cosmetics and living organisms. Proteins  
with chromoprotein activity are also useful as labels in biological  
analyte detection assays, as selectable markers in recombinant  
**DNA** applications (e.g. the production of transgenic cells and  
organisms), and are also useful as sunscreens and selective filters.  
Chromoprotein mutants having fluorescent protein activity useful in  
fluorescence resonance energy transfer (FRET) applications, as  
biosensors in prokaryotic and eukaryotic cells, as markers of whole  
cells to detect changes in multicellular reorganisation and migration,  
as second messenger detectors, as in vivo markers in animals (e.g.,  
transgenic animals), in fluorescence activated cell sorting  
applications, in protease cleavage assays, and in assays to determine  
the phospholipid composition in biological membranes. Proteins with  
**fluorescent protein** activity can also be used as  
fluorescent timers, where the switch of one fluorescent colour to  
another (e.g., green to red) is concomitant with the ageing of the  
protein and is useful for determination of the activation or  
deactivation of gene expression. The present sequence represents an

Anemonia sulcata purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 43.

ACCESSION NUMBER: ADH34495 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of  
**chromo-or fluorescent protein**  
which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Anemonia sulcata asCP mutant H203R.

L8 ANSWER 22 OF 23 DGENE COPYRIGHT 2005 The Thomson Corp on STN  
TI Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
AN ADH34493 protein DGENE  
AB The invention relates to interconverted mutants of chromoproteins (CP) or fluorescent proteins (FP) and nucleic acids encoding them. The mutant is derived from a Cnidarian species, preferably a **non-bioluminescent** Cnidarian species, and most preferably an **Anthozoan** species. The invention is based on the finding that although green fluorescent protein (GFP)-like chromoproteins and fluorescent proteins exhibit some degree of homology, there are certain positions (referred to as 148, 165, 167 and 203; numbering corresponds to GFP) that are occupied by noticeably different residues in the two types of proteins. Mutagenesis of the residues in these key positions in, for example, a **fluorescent protein**, to those found in a chromoprotein is therefore proposed to confer chromoprotein activity on the **fluorescent protein mutant**, with chromoproteins being able to be converted into fluorescent proteins in a similar manner. The invention also relates to expression constructs, vectors, host cells and host cell progeny comprising a nucleic acid of the invention; the recombinant production of an interconverted chromoprotein or **fluorescent protein mutant**; and antibodies specific for interconverted mutant proteins of the invention. The interconverted mutants are useful in any application that employs a chromoprotein or **fluorescent protein**. Fluorescent protein mutants having chromoprotein activity can be useful as coloring agents in, for example, food compositions, pharmaceuticals, cosmetics and living organisms. Proteins with chromoprotein activity are also useful as labels in biological analyte detection assays, as selectable markers in recombinant **DNA** applications (e.g. the production of transgenic cells and organisms), and are also useful as sunscreens and selective filters. Chromoprotein mutants having fluorescent protein activity useful in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, as markers of whole cells to detect changes in multicellular reorganisation and migration, as second messenger detectors, as in vivo markers in animals (e.g., transgenic animals), in fluorescence activated cell sorting applications, in protease cleavage assays, and in assays to determine the phospholipid composition in biological membranes. Proteins with **fluorescent protein** activity can also be used as fluorescent timers, where the switch of one fluorescent colour to another (e.g., green to red) is concomitant with the ageing of the protein and is useful for determination of the activation or

deactivation of gene expression. The present sequence represents an Anemonia sulcata purple chromoprotein asCP mutant generated in an example of the invention. The present sequence is not shown in the specification, but was derived from the wild-type asCP sequence (ADH34487) shown in Fig 1 and the information provided on page 43.

ACCESSION NUMBER: ADH34493 protein DGENE  
TITLE: Novel nucleic acid encoding interconverted mutant of **chromo-or fluorescent protein** which are useful as biosensors, coloring agents.  
INVENTOR: Bulina M E; Chudakov D; Lukyanov K A  
PATENT ASSIGNEE: (CLON-N) CLONTECH LAB INC.  
PATENT INFO: WO 2003057833 A2 20030717 56  
APPLICATION INFO: WO 2002-US41418 20021223  
PRIORITY INFO: US 2001-343128P 20011226  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2003-607998 [57]  
DESCRIPTION: Anemonia sulcata asCP mutant I72N.

L8 ANSWER 23 OF 23 WPIDS COPYRIGHT 2005 THE THOMSON CORP on STN

TI Novel nucleic acid encoding a rapidly maturing **chromo- or fluorescent mutant of a Cnidarian chromo- or fluorescent protein** or its mutant, useful for applications involving **chromo- or fluorescent proteins**.

AN 2003-569236 [53] WPIDS

AB WO2003054158 A UPAB: 20030820

NOVELTY - A nucleic acid (I) that encodes a rapidly maturing **chromo or fluorescent mutant of a Cnidarian chromo- or fluorescent protein** or its mutant, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

- (1) a fragment (II) of (I);
- (2) a construct (III) comprising a vector and (I);
- (3) an expression cassette (IV) comprising, a transcriptional initiation region functional in an expression host, (I), or (II), and a transcriptional termination region functional in the expression host;
- (4) a cell (V), or its progeny, comprising (IV) as part of an extrachromosomal element or integrated into the genome of a host cell as a result of introduction of the expression cassette into the host cell;
- (5) a protein (VI) or its fragment encoded by (I);
- (6) an antibody (VII) binding specifically to (VI);
- (7) a transgenic cell or its progeny, or a transgenic organism comprising a transgene that is (I) or (II); and
- (8) a kit comprising (I) or (II).

USE - (I) is useful in applications involving nucleic acid encoding a **chromo- or fluorescent protein**. (V) is useful for producing a **chromo and/or fluorescent protein** which involves growing the cell, whereby the protein is expressed, and isolating the protein substantially free of other proteins. (VI) is useful in applications involving **chromo- or fluorescent protein** (claimed).

(I) is useful as PCR primers, hybridization probes, etc. The expression cassettes are useful for synthesizing (VI). The chromoproteins are useful as coloring agents which are capable of imparting color or pigment to a particular composition of matter e.g. food compositions, pharmaceuticals, cosmetics, living organisms, e.g., animals and plants. The chromoproteins may also find use as labels in analyte detection assays, e.g. assays for biological analytes of interest and as selectable markers in recombinant DNA applications, e.g. the production of transgenic cells and organisms. The fluorescent proteins find use in a variety of different applications, e.g. in fluorescence resonance energy transfer (FRET) applications, as biosensors in prokaryotic and eukaryotic cells, in applications involving the automated screening of arrays of cells expressing fluorescent reporting groups by using microscopic imaging

and electronic analysis, as second messenger detectors, and in fluorescence activated cell sorting applications and as in vivo marker in animals. The fluorescent proteins also find use in protease cleavage assays. The proteins can also be used in assays to determine the phospholipid composition in biological membranes and as a fluorescent timer.

Dwg. 0/4

ACCESSION NUMBER: 2003-569236 [53] WPIDS  
DOC. NO. CPI: C2003-153632  
TITLE: Novel nucleic acid encoding a rapidly maturing  
**chromo-** or fluorescent mutant of a Cnidarian  
**chromo-** or fluorescent protein  
or its mutant, useful for applications involving  
**chromo-** or fluorescent proteins.  
DERWENT CLASS: B04 D16  
INVENTOR(S): BEVIS, B; GLICK, B  
PATENT ASSIGNEE(S): (UYCH-N) UNIV CHICAGO  
COUNTRY COUNT: 103  
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2003054158	A2	20030703	(200353)*	EN	65
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW					
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW					
AU 2002357322	A1	20030709	(200428)		
EP 1456223	A2	20040915	(200460)	EN	
R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR					

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2003054158	A2	WO 2002-US40539	20021218
AU 2002357322	A1	AU 2002-357322	20021218
EP 1456223	A2	EP 2002-805620	20021218
		WO 2002-US40539	20021218

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2002357322	A1 Based on	WO 2003054158
EP 1456223	A2 Based on	WO 2003054158

PRIORITY APPLN. INFO: US 2001-341723P 20011219